FACT SHEET

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

APPLICANT:	Port of Ridgefield, Lake River Industrial Site (LRIS)
FACILITY LOCATION:	111 West Division Street Ridgefield, WA 98642
PERMIT NUMBER:	WA0041025
ACTIVITY:	Remediation of Contaminated Groundwater
LOCATION:	45° 49' 13" N; 122° 45' 11"
RECEIVING WATER:	Lake River

PUBLIC COMMENT AND INFORMATION

The Port of Ridgefield, Lake River Industrial Site (LRIS) has applied for a National Pollutant Discharge Elimination System (NPDES) Permit in accordance with provisions of Chapter 90.48 RCW, as amended, and the Federal Water Pollution Control Act (Clean Water Act), Title 33 United States Code, Section 1241 et. seq.

The permit authorizes the discharge of treated groundwater to Lake River, subject to effluent limitations and other conditions necessary to carry out provisions of state and federal law. Notice of the draft permit was published on June 24, 2002, in the *Columbian*. The public comment period closed on July 24, 2002.

Ecology has modified the draft NPDES permit and is issuing the final permit. A responsiveness summary that responds to public comment is attached as an addendum to this fact sheet. Comments were received from the City of Ridgefield. A SEPA checklist was submitted and public noticed from April 10, 2002, to May 10, 2002. The lead agency was Port of Ridgefield.

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1. Receiving Water

The receiving water is Lake River via Outfall #3. Because of impairment for temperature, fecal coliform and sediment, Lake River is placed on 303(d) list. The applicable receiving water quality standards are those adopted by Ecology and approved by the Environmental Protection Agency (EPA) Regional Administrator pursuant to Section 303 of the Clean Water Act. Applicable standards are contained in Chapter 173-201 WAC.

2. Facility Background and Description of Discharge

The Port of Ridgefield LRIS is located on a 41-acre parcel owned by the Port of Ridgefield. The LRIS is the former location of the Pacific Wood Treating Corporation (PWT) facility. The Port owns the property, which was leased by PWT from approximately 1964 to 1993. PWT surface treated and pressure treated lumber at the LRIS. PWT filed for bankruptcy in 1993, and the site was subsequently abandoned. The Port has established office spaces and currently manages the property and remaining assets.

PWT's former operations included wood treating and fabrication activities. PWT pressure-treated specialty wood products with oil-based treatment solutions containing creosote, Pentachlorophenol (PCP), and a water-based mixture of copper, chromium, and chromated copper arsenate (CCA) or copper, chromium, and zinc. PCP was normally stored in the tank farm as a 40-percent concentrate in "P9 oil." The P9 oil consisted of diesel and about 10 percent long-chain alcohols and ketones. When used, the PCP concentrate was typically mixed with additional P9 oil, or occasionally mineral spirits, to form a 2 to 5 percent PCP solution.

Copper naphthenate was used by PWT as an alternative for treating with PCP. It was generally handled and used in the same manner as described above for PCP. CCA, a water-based solution, was also stored in the tank farm, as was creosote.

Other wood-treating chemicals were used by PWT. These included Woodgard™ and Fyrgard™. Woodgard™ consisted of boric acid and paraffin wax in hexylene glycol. Fyrgard™ consisted of ammonium phosphate, ammonium sulfate, boric acid, and borax in a water-based carrier.

The treating process generally consisted of placing the wood (poles or dimension lumber) into a retort (pressure vessel), pumping the treating solution from the tank farm, and mixing it to the required concentration (if necessary), pumping it into the retort, and applying the chemical to the wood using heat and pressure. Following treatment, the excess solution from the retorts was recovered, and stored for reuse in tanks, or routed to the wastewater treatment plant. As a final step, a vacuum was applied to remove residual preservative from the surface of the wood. The wood was then pulled out of the retorts on a series of tram tracks and allowed to stand on the drip pad (south of the retorts) before it was moved by rail to the unloading and storage areas.

Under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW, the Port of Ridgefield, and Ecology negotiated a consent decree to further investigate and remediate soil and groundwater contaminated by wood treating chemicals from the former PWT facility at the Port of Ridgefield. One of the requirements of the consent decree is the design and implementation of a steam enhanced remediation system hydraulic gradient control, recovery of light nonaqueous phase liquids (LNAPL), and extraction and treatment of dissolved phase contaminated groundwater. Another requirement of the consent decree is the removal of dense

nonaqueous phase liquids (DNAPL), which are also present in the shallow aquifer beneath the site.

The groundwater extraction system will consist of 17 or more individual extraction wells. The steam recovery rate will be about 100 gpm. Each well will utilize a dual pump system to separately remove LNAPL and dissolved phase contaminated groundwater.

The groundwater treatment system will consist of effluent cooling, phase separation (gravity separator and dissolved air flotation gravity separator in series), heavy metals treatment, and a granular activated carbon (GAC) system (two units in series). Extracted nonaqueous phase liquids (NAPL) will be pumped into a surge tank where NAPL and aqueous phases will be separated. Aqueous phase from the NAPL separation process will be pumped into a heavy metals treatment unit following cooling in a heat exchanger so that copper, chromium, arsenic, and zinc can be removed from the water, as necessary. The water will then be filtered in multi-media filters, and organic contaminants will be removed by a GAC system. Sludge from the filter elements will be disposed of off-site. The treated water will be cooled to meet surface water discharge criteria and discharge to Lake River. A detailed description of the effluent treatment system and a flow diagram is contained in Appendix A.

The overall remedial action will be implemented in two major steps to address the emergency action response needs of the remediation project and to affect optimization of the treatment system, and a full scale implementation of the remediation, as necessary, following the results of the Phase I efforts.

The treatment system and subsequent treatment study have been designed to accommodate the ramp up and steady-state operation of the system. The treatment study will highlight the process optimizations that can be achieved to ensure that the system will meet interim and final discharge limits. The study period will last for a period of six months, and performance will be monitored through the interim discharge limits, reporting and through the detailed operation and maintenance program that is required. Internal system checks (both visual and analyzer-based) will be utilized to determine that treatment units within the system are meeting unit-specific efficiencies, in addition to overall system efficiencies required to meet discharge limits. In addition, effluent generated from the treatment process will be recycled, to an extent possible, to limit the total flow to outfall. A detailed operations and maintenance plan will be developed and submitted within 90 days after treatment system start-up, to ensure process parameters are adequately monitored and that the system will be meeting treatment objectives.

3. Effluent Limits

This permit will have interim effluent limitations. Within one year of operations, the available influent and effluent data will be evaluated. Based on the data, the final permit limits will be developed. The final effluent limits in the permit will be the more stringent of the water quality standard, human health based standard or technology based (performance based) for every parameter.

For the interim permit limitation, the permit limits will be established for Polycyclic Aromatic Hydrocarbons (PAH), PCP, temperature, and pH.

The permit limit for PAH is based on 99.5 percent removal efficiencies of the influent PAH concentration. The 99.5 percent PAH removal will be achieved by application of all known,

available, and reasonable methods of prevention, control, and treatment (AKART) to the influent. The influent data and the removal efficiencies calculation are in Appendix A. Based on 99.5 percent removal efficiency of PAH, the interim permit limit for monthly average and daily maximum is 131µg/l.

The permit will require a detection limit of 1.5 µg/l for PAH. The human health criteria for each carcinogenic PAH is 0.031 µg/l. Testing at the lower detection limit for PAH will provide information for comparison with the human health standard for every carcinogenic PAH. Footnote 1 in Table A specifies the carcinogenic PAHs.

The permit limit for PCP is the chronic water quality criteria for fresh water which is 13 µg/l for monthly average and daily maximum.

The temperature and pH permit limits are equivalent to water quality criteria. The temperature limit is 18 C and pH is 6-9 S.U.

In addition to interim permit limits, heavy metals, oil and grease, total suspended solids, and volatile and semi-volatile organics will be monitored during the first six months of the permit. The final effluent permit limits will be established based on available data within one year of permit issuance.

During the one year interim period, the Permittee will be authorized to discharge treated groundwater from the groundwater treatment system at the permitted location subject to meeting the following limitations:

TABLE A: INTERIM PERMIT LIMITS

EFFLUENT LIMITATIONS		
Parameter	**Monthly Average**	**Daily Maximum**
Total PAHs[1]	131 µg/L	131 µg/L
Pentachlorophenol (PCP)	13 µg/L	13 µg/L
Temperature	18˚ C	18˚ C
PH	6-9	6-9

4. Monitoring and Reporting

Effluent samples will be collected from a sample port located in the groundwater treatment system final effluent line prior to the tie-in Outfall #3. In addition, influent samples shall be

[1] Total polynuclear aromatic hydrocarbons are defined as the summation of the 16 following polynuclear hydrocarbons that are considered carcinogenic compounds:

Naphthalene	Acenaphthylene
Acenaphthene	Fluorene
Phenanthrene	Anthracene
Fluoranthene	Pyrene
Benzo(a)anthracene	Chrysene*
Benzo(b)fluoranthene*	Benzo(k)fluoranthene*
Benzo(a)pyrene*	Dibenzo(a,h)anthracene*
Benzo(ghi)perylene*	Indeno(1,2,3-cd)pyrene*

collected weekly and analyzed for pentachlorophenol, so that removal efficiencies can be determined. Sampling and analysis of the effluent will be required according to the following schedule:

Tests[2]	**Sampling Frequency**	**Sample Type**
Discharge Flow[3]	Continuous	Recording
Total PAHs[4]	Daily for first five days of operation, then weekly for six months (composited on a monthly basis), then monthly after six months.	Composite
Volatile and Semivolatile Organics	Daily for first five days of operation, then weekly for six months (composited on a monthly basis), then monthly after six months.	Composite
Pentachlorophenol[5,6]	Daily for first five days of operation, then weekly for six months (composited on a monthly basis), then monthly after six months.	Composite
Total Metals (arsenic, chromium, copper, zinc)[7]	Daily for first five days of operation, then weekly for six months (composited on a monthly basis), then monthly after six months.	Composite
pH	Daily for first five days of operation, then weekly for six months (composited on a monthly basis), then monthly after six months.	Composite
Temperature	Daily	Grab
Total Suspended Solids	Daily for first five days of operation, then weekly for six months (composited on a monthly basis), then monthly after six months.	Composite

5. Solid Waste/Residual Solids Disposal

This permit requires LRIS to handle and dispose of all solid waste in a manner that prevents its entry into ground or surface waters of the state. As part of groundwater treatment, sludge and spent carbon will be generated. The treatment system operations and maintenance plan is required to include a plan for the appropriate disposal of these materials.

[2] All samples shall be collected from the sample point located in the treatment system final effluent line prior to the tie-in to the LRIS outfall, except for temperature, which will be monitored at the point the outfall discharges to Lake River.
[3] Flow shall be measured by a continuous flow meter or other methods of similar accuracy (within ± 5 percent).
[4] Each of the 16 priority pollutant PAHs identified in S1.A. above shall be quantified and reported separately using EPA Method 610, HPLC option with UV and fluorescence detection. The 16 individual PAHs shall be summed to arrive at a Total PAH value. A non-detect value shall be reported as half the detection limit for the purposes of determining compliance with the Total Polynuclear Aromatic Hydrocarbon limit.
[5] Pentachlorophenol shall be quantified using EPA Method 604 with required use of capillary columns DB1 and DB1301 with an ECGC detector and derivation using diazomethane. For the purpose of this monitoring, a detection limit of 0.1 ppb shall be achieved with calibration at 0.2, 1, 5, 10, and 20 ppb.
[6] An influent sample shall also be collected and analyzed for pentachlorophenol. The influent sample shall be collected just prior to entering the treatment unit. The influent and effluent grab samples shall be collected at such times that the results can be used to determine the pentachlorophenol removal efficiency across the treatment system.
[7] All metals shall be reported as total recoverable metals. All metal analytic methods shall be sensitive enough to detect compliance or noncompliance with freshwater ambient water quality criteria.

6. Whole Effluent Toxicity

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to characterize both the acute and chronic toxicity of the effluent.

If acute or chronic toxicity is measured during effluent characterization at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the acute or chronic toxicity. The proposed permit will then require the Permittee to conduct WET testing in order to monitor for compliance with either an acute toxicity limit, a chronic toxicity limit, or both an acute and a chronic toxicity limit. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC_{50}, EC_{50}, IC_{25}, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittee send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in

an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

7. Chemical Analysis of Influent and Effluent

Chemical analyses of influent and effluent samples will be conducted. The purpose of these studies is to characterize the actual influent to the treatment system and determine if effluent limits need to be established for additional parameters.

Influent sampling for the above parameters shall be timed to coincide with the effluent testing schedule described in Section 4 of the face sheet. Influent sampling for conventional and non-conventional parameters (except for Dioxins) shall be collected monthly for the first six months. Influent and effluent sampling for Dioxins shall be collected monthly for the first three months. The results of influent and effluent sampling described in this section will be used in conjunction with the results from testing described in Section 4 of the fact sheet to perform the Treatment Study described in Section 8.

The influent and effluent will be analyzed for PAHs, pentachlorophenol, dioxins, total suspended solids, pH and total metals. These parameters were selected because existing monitoring well data presented in the permit application are limited, and the need for effluent limits for these parameters cannot be determined. In addition, temperature will be measured daily by grab sample and the discharge flow measured continually.

8. Treatment Study

A treatment study will be conducted to generate data to evaluate technology-based effluent limits and establish AKART. The efficiency of the heavy metal treatment, liquid phase carbon, and GAC treatment components, as well as the overall efficiency of the treatment system, will be determined. In addition, operation and maintenance costs incurred during the study will be provided by the Permittee.

The data from the treatment study will be used to derive technology-based effluent limits for PAH and pentachlorophenol. Technology-based effluent limits can then be compared to water-quality-based and human health based effluent limits.

9. Spill Plan

NAPL and aqueous phase contamination will be removed from the shallow aquifer beneath the site. The NAPL will be separated from the groundwater and transferred into storage tanks. Every few months, NAPL will be transported from the site to a waste disposal facility for proper treatment and disposal.

Preventative measures are necessary to avoid spills. Approved procedures for spill containment and control are required.

10. Treatment System Operation and Maintenance Plan

An approved treatment system operation and maintenance plan is required to ensure that the treatment system performs efficiently. The plan will provide technical guidance and regulatory requirements to the treatment system operator to optimize operation under both normal and emergency conditions.

All waste materials (e.g., spent carbon, solids, and maintenance-related materials) will be identified and properly disposed of. It will be determined if the Dangerous Waste Regulations (Chapter 173-303 WAC) apply to any wastes.

11. Total Suspended Solids Study

A particulate study is not required in the permit because the particulate fraction in the effluent is expected to be minor. The treatment system includes GAC filtration.

12. Sediment Monitoring and Outfall Evaluation

Sediment monitoring and an outfall evaluation are not required in the permit. A site-wide sediment sampling program has been initiated to determine the impact from stormwater discharges from historical operations as part of the Remedial Investigation Study undertaken by the facility, and administered by Ecology. In addition, discharges from wastewater treatment system enforced under this permit will not likely have the potential to impact the sediment concentrations based on the percentage that they represent of the total facility outfall flow, and based on the water quality standard-based discharge limitations that will be established and met under this permit.

13. Permit Reopener

A permit reopener statement has been included in the permit. If the results of any of the studies discussed above indicate that further action (e.g., development of technology-based limits, additional monitoring, or a toxicity reduction evaluation) is necessary, the permit reopener will allow Ecology to modify existing permit conditions and limitations or establish new conditions or limitations on the basis of monitoring results or other causes consistent with state and federal regulations.

14. Permit Fees

The discharge authorized by this permit is from a groundwater extraction and treatment system, which is a remedial action under the MTCA (Chapter 173-340 WAC). Ecology costs associated with this permit will be recovered as outlined in WAC 173-340-550, Payment of Remedial Action Costs. Therefore, permit fees established under Chapter 173-224 WAC are not applicable to this permit.

15. Permit Length

This permit is issued for a period of five years.

SUMMARY OF SCHEDULED ACTIVITIES AND REPORT SUBMITTALS

Permit Section	Submittal/Activity	Frequency	First Submittal Date
S3.A	Discharge Monitoring Report	Monthly	
S5.A S5.B and S6.A S6.B	Acute and chronic biomonitoring testing and Report	Quarterly	One year after system startup, quarterly for four quarters.
S5.B S6.B	Submit final report of acute and chronic		Within 90 days after the last sampling event for effluent characterization
S8.A	Conduct treatment study		Sections 7 and 8 of the fact sheet
S8.B	Submit results of each sampling event included in the treatment study		Include in DMR for the month following receipt of results
S8.B	Submit final summary report on the treatment study		Within 90 days after the end of the treatment study
S9.	Spill control plan	1/permit cycle, updates submitted as necessary	Within six months after permit issuance
S10.	Treatment system operation and maintenance plan		Within 90 days after treatment system start-up

REFERENCES

1. Steamtech Environmental Services and Maul Foster & Alongi, Inc., February 19, 2002, Interim/Emergency Action Engineering Design Report, Port of Ridgefield, Lake River Industrial Site, Agreed Order No 01TCPSR-3119.

2. Washington Department of Ecology, July 18, 2001, Port of Ridgefield, Lake River Industrial Site, Agreed Order No 01TCPSR-3119.

4. U.S. EPA, 1991, Technical Support Document for Water Quality-based Toxics Control.

5. Washington Administrative Code, Chapter 173-201.

6. Washington Administrative Code, Chapter 173-220.

7. Washington Administrative Code, Chapter 173-240.

8. Washington State Department of Ecology, 1990, Permit-Writers Manual.

APPENDIX A

Table 1
PAHs/PCP Groundwater Data Summary
Interim Effluent Limitations Estimation
Port of Ridgefield, Lake River Industrial Site
Ridgefield, Washington

Site Identification	Sample Date	Sample Depth	Units	Total PAHs	Outliers Removed [A]	PCP		Outliers Removed [A]
B-245	15-Dec-99	30	ug/l	6158		3600		
B-30	01-Dec-97	25	ug/l	28580		125	x	
B-30	01-Dec-97	45.5	ug/l	4446		62.5	x	
B-31	26-Nov-97	20	ug/l	15400		1100		
B-33	04-Dec-97	20	ug/l	34889		1600		
B-33	04-Dec-97	50	ug/l	2370		4000		
B-34	26-Nov-97	20	ug/l	41440		920		
B-36	03-Dec-97	20	ug/l	232700		10000		
B-36	03-Dec-97	40	ug/l	10605		4500		
B-37	03-Dec-97	20	ug/l		509500	2500	x	
B-38	05-Dec-97	20	ug/l	96929		3500		
B-39	19-Jan-98	20	ug/l	88750				25000
B-39	19-Jan-98	46.5	ug/l	1929.5				
B-40	11-Dec-97	20	ug/l		314520			64000
B-41	10-Dec-97	20	ug/l	49890		14000		
B-41	10-Dec-97	42	ug/l	4120		2100		
B-42	09-Dec-97	22	ug/l	62210		340		
B-42	09-Dec-97	48	ug/l	6755		130		
B-43	20-Nov-97	20	ug/l	15305		480		
B-46	19-Nov-97	18	ug/l	147346		125	x	
B-48	20-Nov-97	20	ug/l	21847		6300		
B-49	25-Nov-97	20	ug/l	147210		3700		
B-49	25-Nov-97	48	ug/l	5743		16000		
B-50	21-Nov-97	20	ug/l	15162		1500		
B-51	24-Nov-97	20	ug/l	38470				38000
B-51	24-Nov-97	52	ug/l	3140.75		12000		
B-52	21-Nov-97	20	ug/l	57936		10000		
B-53	14-Jan-98	20	ug/l	17660		3100		
B-53	14-Jan-98	45.5	ug/l	14373		2000		
B-54	15-Jan-98	17.5	ug/l	189980		6600		
B-54	15-Jan-98	51.5	ug/l	18548		2300		
B-55	15-Jan-98	25	ug/l	7892		1700		
B-55	15-Jan-98	46	ug/l	3411.1				
B-56	16-Jan-98	25	ug/l	14330				24000
B-56	16-Jan-98	47	ug/l	2650.5		18000		
B-57	16-Jan-98	20	ug/l		463400	12000		
B-57	16-Jan-98	51.5	ug/l	1808.5		13000		
B-58	19-Jan-98	17	ug/l		1424250			190000
B-58	19-Jan-98	51.5	ug/l	2778				

Site Identification	Sample Date	Sample Depth	Units	Total PAHs	Outliers Removed [A]	PCP		Outliers Removed [A]
B-76	17-Jun-98	30	ug/l	274.8		9		
B-79	18-Jun-98	20	ug/l	2800.1		280		
DEW-1	23-Mar-99	0	ug/l	5285.35		3600		
DEW-1	24-Mar-99	0	ug/l	5631.55		3700		
DEW-1	25-Mar-99	0	ug/l	5839.75		4000		
DEW-1	26-Mar-99	0	ug/l	5912.35		3800		
DEW-1	27-Mar-99	0	ug/l	5165.15		2500		
DEW-3	10-Mar-00	0	ug/l	5744.5		3400		
DEW-3	13-Mar-00	0	ug/l	7810.5		3500		
DEW-3	17-Mar-00	0	ug/l	6664.2		2600		
DEW-3	20-Mar-00	0	ug/l	8081.85		2800		
DEW-3	23-Mar-00	0	ug/l	7653.15		3500		
DEW-3	29-Mar-00	0	ug/l	5747.95		2700		
DEW-3	30-Mar-00	0	ug/l	4723.95		2300		
DEW-3	07-Apr-00	0	ug/l	5675.05		3600		
MW-11D	03-May-93	0	ug/l	21.365				
MW-11S	03-May-93	0	ug/l	37555				
MW-11S	23-Oct-97	0	ug/l	151650				
MW-11S	05-May-98	0	ug/l	131100		2500	x	
MW-11S	20-Mar-01	19	ug/l	15676		470		
MW-12	03-May-93	0	ug/l	3633				
MW-12	30-Sep-97	0	ug/l	3805		22000		
MW-12	05-May-98	0	ug/l	2726		13000		
MW-12	05-May-98	16.68	ug/l	2726		13000		
MW-12	17-Jul-98	48	ug/l	2885.45		8800		
MW-12	06-Nov-98	48	ug/l	3447.5		8300		
MW-12	22-Jan-99	48	ug/l	2250.3		14000		
MW-12	22-Apr-99	48	ug/l	2810.75		15000		
MW-12	13-Jul-99	48	ug/l	120.35		3000		
MW-12	07-Oct-99	48	ug/l	1779.65		7800		
MW-24	02-Apr-96	19.57	ug/l	14038		2500		
MW-24	05-May-98	13.99	ug/l	256000		2500	x	
MW-24	17-Jul-98	19	ug/l		344450	7000		
MW-24	09-Nov-98	19	ug/l	244900		3000		
MW-24	26-Jan-99	19	ug/l	54098		560		
MW-24	28-Apr-99	19	ug/l	5474.2		1600		
MW-24	13-Jul-99	19	ug/l	25415		2900		
MW-24	12-Oct-99	19	ug/l	11499		2200		
MW-24	20-Mar-01	17	ug/l	1462.8		1400		
MW-7	10-Apr-91	0	ug/l			2300		
MW-7	03-May-93	0	ug/l	145.3				
MW-7	30-Sep-97	0	ug/l	80		15	x	
MW-7	30-Apr-98	0	ug/l	80		12.5	x	
MW-7	30-Apr-98	25.19	ug/l	80		12.5	x	

Site Identification	Sample Date	Sample Depth	Units	Total PAHs	Outliers Removed [A]	PCP	Outliers Removed [A]
MW-7	16-Jul-98	43	ug/l	1		37	
MW-7	06-Nov-98	43	ug/l	0.85		6	
MW-7	25-Jan-99	43	ug/l	18.25		19	
MW-7	27-Apr-99	43	ug/l	0.85		1.6	
MW-7	12-Jul-99	43	ug/l	0.85		11	
MW-7	07-Oct-99	43	ug/l	1.05		68	
PWT-1	10-Apr-91	0	ug/l			1400	
PWT-1	03-May-93	0	ug/l	73.605			
PWT-1	01-May-98	0	ug/l	714		12.5 x	
PWT-1	01-May-98	17	ug/l	714		12.5 x	
PWT-1	20-Jul-98	35	ug/l	274.35		1.5	
PWT-1	09-Nov-98	35	ug/l	417.35		1	
PWT-1	22-Jan-99	35	ug/l	223.65		0.2 x	
PWT-1	28-Apr-99	35	ug/l	407.45		2.1	
PWT-1	08-Jul-99	35	ug/l	91.35		0.2 x	
PWT-1	12-Oct-99	35	ug/l	26.95		0.5	
PWT-2	10-Apr-91	0	ug/l			150	
PWT-2	03-May-93	0	ug/l	3281.55			
PWT-2	23-Oct-97	0	ug/l	80		12.5 x	
PZ-01	30-Sep-97	0	ug/l	230		12.5 x	
n				95		88	
Number of detections				95		73	
Detection frequency				100%		83%	
Average				2.61E+04		3.81E+03	
Max				256000		22000	
Min				0.85		0.2	

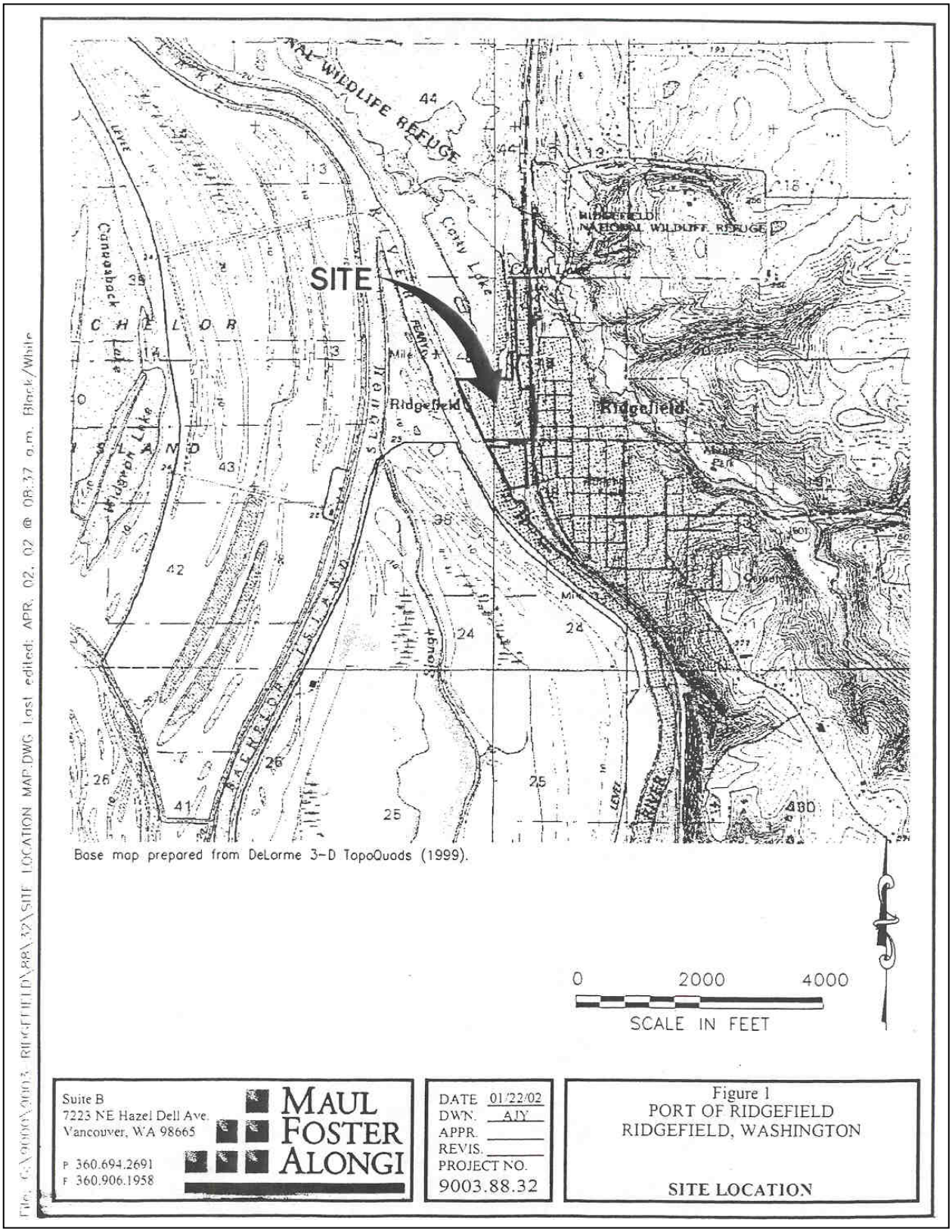
Consituent	Average	99% [B]	ug/L
PAHs	2.61E+04	1%	261
PCP	3.81E+03	1%	38

Notes:

[A] = Five outliers were detected by Rosner's Test and subsequently removed from the data set.

x = The sample analysis produced a result of Non Detect, therefore, one half the Method Reporting Limit (MRL) was used for statistical evaluation. In some cases, sample dilution, and/or interference can lead to elevated MRLs.

[B] = Efficiency of system (%) based on assumption of reasonably attainable removal of constituents with the current treatment system design. Treatment system study data and additional information on influent concentrations and system optimization will confirm these assumptions.


SITE
Ridgefield
Ridgefield
Base map prepared from DeLorme 3-D TopoQuads (1999).
0
2000
4000
SCALE IN FEET
Suite B
7223 NE Hazel Dell Ave.
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F 360.906.1958
MAUL FOSTER ALONGI
DATE 01/22/02
DWN. AJY
APPR.
REVIS.
PROJECT NO.
9003.88.32
Figure 1
PORT OF RIDGEFIELD
RIDGEFIELD, WASHINGTON
SITE LOCATION